March 29: Returned to operating room; under anesthesia patient coughed, and considerable pus exuded into wound opening. The syringe was inserted and a large abscess found posterior to incision instead of anteriorly toward bifurcation, as was originally supposed. Drainage from wound after this was considerable and uninterrupted.

April 15: Patient is convalescing. Very little pus from wound; cough and other symptoms have almost ceased. Recovery should be complete in this case.

Criticism: In spite of most careful fluoroscopic examination and stereoscopic plates, we were deceived as to the exact location of this abscess.

Case 4. I. A., a child 5 years old, of healthy parents, susceptible to attacks of Acute Bronchitis. Developed influenza five weeks previous to having an X-ray taken. Ran a temperature 104-105, had definite localized lesion right base, still running a temperature at time X-ray was taken. Some cough, no expectoration.

Plate shows exudate or influenzal spot which will disappear under rest.

Case 5. J. F. Long-standing history of cough in coal miner.

X-ray shows marked pneumokoniosis.

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A REVIEW OF THE PNEUMONIA OF LAST YEAR.*

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An unprecedented prevalence of pneumonia has occurred during the last year associated with the massing together of men for war purposes and the recent epidemics of influenza, measles, and streptococcal infections. So many articles have been written within the last twelve months dealing with the symptoms and the changes in the routine treatment of these pneumonias and of empyema that it seems proper at this time to review the situation.

The pneumonias, broncho-pneumonias and their complications, which occurred before the great pandemic of influenza evidenced itself, presented some most unusual features and these will be considered in this paper. The influenzal pneumonias will not be discussed since this was thoroughly done in a recent article by Reed in this journal.

Pneumonia became the problem of the Army as soon as the camps were established. Several cantonments had epidemics of hemolytic streptococcal pneumonias of great severity, some of them being associated with measles. Indeed, W. H. Welch stated that the enhanced virulence of the streptococcus was the most important problem of the war. Moreover pneumococci belonging to the formerly less harmful Groups II. and IV., began to show remarkable increase in producing disease. Lobar pneumonia, such as that of civil life, became unusually fatal because of secondary infections with streptococci. Indeed unless so complicated, many observers including Stone, Camac, and Opie feel that lobar pneumonia is relatively harmless. Staphylococcal pneumonia, as described by Chickering and Park, has been rather frequent and very fatal in certain camps.

The mortality in these pneumonias at times has been exceedingly high. Stone quotes the average mortality for lobar pneumonia as being 45 per cent. and for broncho-pneumonia complicating measles as 23 per cent. In some other camps the mortality for broncho-pneumonia has been nearer 50 per cent. A most striking fact has been the varying mortality from month to month, being highest during March and April and least in November. This has been due to the increased virulence of the pneumococci and the frequency of the hemolytic streptococcal infections.

Cummings comments on the marked fatality of hemolytic streptococcic septicaemias. Hirsch found the virulence of pneumococci belonging to Groups II. and IV. unusually severe in Camp Grant. The mortality, moreover, has been raised because of the frequency of empyemas which at first were exceedingly fatal.

The diagnosis of lobar pneumonia has been without difficulty, initiated as it usually is by a chill and high fever. Broncho-pneumonia, however, was often overlooked at first, thus leading to serious consequences because of the patient being up and around. It was to be suspected when the patient became restless and developed cyanosis and dyspnoea as the fever persisted. Moist crackling rales developed in one or both lungs with no definite consolidation. The pulse became weak. Drenching sweats were apt to occur. The fever was irregular and finally fell by lysis.

The X-ray has been especially efficient in showing consolidation in the lungs before physical signs develop. These characteristics of the X-ray picture in lobar and broncho-pneumonia have been well described by Davis in a recent article. It would be fortunate if every suspicious pneumonia could be roentgenographed. However, the X-ray can only be made use of for this purpose in modern hospitals or clinics.

Blood counts show a leucocytosis in both broncho and lobar-pneumonias, being slightly higher in the former. Cole, and later Dunham, comment on the rather infrequent positive blood cultures. One of the best series of blood cultures was that of McClelland who obtained 19.3 per cent. positives. Of these 46 per cent. were due to Type I. pneumococcus, 25 per cent. Type II., 4 per cent. Type IV., and 35 per cent. streptococcus hemolyticus. As mentioned before, in other camps, Group II., and especially Group IV., pneumococci far outnumbered Group I. in frequency.

*Read before the Alameda County Medical Society.

The modern method of determining the types of pneumococci and streptococci in the sputum, developed through the work of the Rockefeller Institute under the leadership of Rufus Cole, Rosenow of the Mayo Clinic, and others, has made possible the accurate determination of the organisms causing pneumonia. Of the four recognized types of pneumonia, infections due to the third have been absent in practically every camp. Types II. and IV. have been largely responsible though in some camps, pneumonia due to Type I. has been fairly common. In contrast to this prevalence, it is interesting to compare Cole's findings in 1917 which showed 65 per cent. of lobar pneumonias due to Groups I. and II. with 25 to 35 per cent. mortality, and 10 per cent. due to Group III., these being most severe. Group IV. consisting of the ordinary mouth pneumococci rarely caused pneumonias. It was found that organisms of Groups I. and II. could be carried for a few weeks in normal mouths, whereas Group III. organisms could be carried for years. The streptococcal pneumonias have been due most frequently to the hemolyticus, though the non-hemolytic streptococcus has been responsible at times.

The treatment of pneumonia has been somewhat revolutionized in the last few years, again largely through the work of Cole and his associates. Fresh air has been found most important because of the disturbed respiration. In a very convincing article, Stone shows the much lower mortality among cases which have been thoroughly digitalized. He followed the method of Eggleston in administering digitalis, giving about .15 c.c. of a standard tincture of digitalis for every pound of body weight in graduated doses during the first 48 hours of the treatment, following this by smaller tonic doses. For falling blood-pressure and intestinal atony pituitary extract has been used. Atropin has been useful in pulmonary edema and bronchorrhea. Care must be taken, it has been found, with irritating enemas since thrombosis in the hemorrhoidal veins with resulting pulmonary embolism, may occur. Fluids must be forced if necessary by rectum and intravenously. Litchfield has had encouraging results in desperate pneumonias with 25 per cent. glucose intravenously, though others have been unable to see the same benefit.

The use of serum in pneumonia is of recent development. It is generally conceded in pneumonia due to Type I. that about 100 c.c. of Type I. serum should be given intravenously daily for three or four days. Redden recently recommends only eight-hour intervals between doses. That this treatment is beneficial is shown by the frequent abortions of those pneumonias and by demonstrations, such as that of McClelland, that positive blood cultures disappear after serum treatment. Spooner and Sellards point out the importance of the serum being of high titer. In their Type I. pneumonias where serum of low titer was used, the mortality was 53 per cent. as compared with 7 per cent. where serum of high titer was employed. Polyvalent serum is not recommended by all, though at Camp McArthur cases which received such serum routinely in spite of the type of pneumococcus found, have run a milder course with a lower mortality than where such serum was not used. Camac also recommends such use of polyvalent serum. Reed recently calls attention to the use of blood transfusions from donors convalescent from the same type of pneumonias as that suffered by the patient.

In severe pneumonias due to the streptococcus, anti-streptococcic serum is probably indicated though it must be given in at least 50 c.c. doses. However, Stone states that the maximal good from streptococcic serum will not result until a polyvalent serum, potent for all known strains of pathogenic streptococci, is obtainable.

To prevent serum anaphylaxis all patients should be given 1 c.c. of serum subcutaneously followed in half an hour by 1 c.c. intramuscularly. If no local or general reaction results at the end of one hour the administration of the full dose can be started though the first 15 c.c.s should be given very slowly. If the patient is sensitive, very small doses of serum given over several hours in increasing amounts will desensitize him. If the patient shows signs of sensitiveness to serum after it has been given, he will within twenty minutes become uneasy, begin to scratch his skin, breathe rapidly and become apprehensive and moderately cyanotic. If one milligram of atropin and 1 c.c. of adrenalin are then given intramuscularly on the appearance of these symptoms, they will all disappear within fifteen minutes and serum treatment can be continued within 1 hour.

One of the most serious developments of the past year has been the prevalence of empyemas in pneumonias, particularly those due to the streptococcus. In the latter type, empyemia has come on exceedingly early and in some camps even 36 per cent. of streptococcal pneumonias have been thus complicated.

The diagnosis of these empyemas is most important. Clinically they may be recognized by increased respiratory and pulse rates, by increased cyanosis, and delayed resolution. The temperature may be slight or even absent. On examination of the chest, weak voice sounds, diminished tactile and vocal fremitus and whispered voice sounds, together with flatness are the most important signs in suggesting fluid. Sweating is usually very marked as emphasized by Brooks. A septic appearance is apt to develop.

The X-ray is especially serviceable in locating inter-lobar empyema and in showing fluid in the pleural cavities.

If empyema is suspected at any time, exploration with an aspirating needle about four centimeters long must be repeatedly done until the fluid is obtained. This last procedure is universally recognized as being the most important means in diagnosing empyemas.

In the varying camps the mortality due to empyema has varied. At Camp Meade for instance, empyemas due to pneumococcus showed 40 per cent. mortality, while those due to streptococcus showed 41 per cent. In another camp 23 per cent. of all pneumonias developed empyema, 54 per cent. of which died.

In the empyemas due to streptococcus which have often developed during the first few days of the pneumonia, it has been found that a thin exudate at first forms and that if an operation is done at this time the mortality is exceedingly high. Thus twenty-two of such cases commented on by Brooks due to the streptococcus and operated on early, nearly all died. It is now conceded that such empyemas must be merely aspirated every one to three days according to the embarrassment of respiration until the pus becomes thick and creamy. If necessary a little salt solution can be introduced to dilute the pus and enable it to be withdrawn. Then finally either surgical intervention can be resorted to if it is deemed best to do a costectomy or a thoractomy, or the empyema may be treated by one of the closed methods some of which are briefly mentioned below.

The empyema commission has suggested that a drainage opening from two to four inches in length be established so that a double-barreled drainage tube can be introduced through a rubber dam attached to the skin by adhesive. Suction is established on one tube and in this way the lung can be kept from collapsing. Dakin's solution can be instilled and drawn off from the cavity through the other, thus preventing the persistence of the streptococcic infection. Garbat points out that the empyema should not be considered cured until the cultures from the cavity itself are negative. By this treatment the mortality in empyemas has been reduced from between 30 and 85 per cent. to 4.3 per cent. in Camp Lee. Thoracotomy and this introduction of Carrel tubes is not to be recommended because of the necessity of an open thorax.

McKenna, and in a later article Mozingo, recommend another procedure for the closed drainage of empyemas irrespective of the character of the pus present. A trocar and cannula just large enough to thread a No. 14 French catheter into it, is introduced into the chest, at the most suitable point, as determined by the X-ray. After the catheter has been inserted the cannula is withdrawn. The pus from the cavity is then drained off. The catheter is left in place and there is left in the cavity an amount of Dakin's solution equal to one half the number of c.c.s of pus withdrawn. The drawing off and instillation of this Dakin's solution is repeated five times a day by either an experienced nurse or the surgeon. After seven days the pyogenic membrane is usually dissolved by Dakin's solution. Mozingo then recommends the use of formaldehyde instillation which was found to sterilize cavities which did not become sterile with Dakin's solution. In the presence of other pockets of pus similar to those along the sternal pleura, which have proved so fatal according to Stone, the above procedure is repeated. The advantage of the use of the catheter is that the lung is not damaged, open pneumothorax is not produced, and sinuses are not so apt to follow as when thoracotomy is done.

The use of a Brewer tube with a stiff rubber suction bulb attached has been recommended by Blankenhorn as another closed method for the drainage of empyemas.

The danger of open pneumothorax is pointed out by Graham and Bell in an excellent article based on experimental work. They found a normal person can stand an opening two inches by 4 inches only a short time, since the change in pressure is transmitted through the mobile mediastinum to the opposite lung. Thus in pneumonia where the air passages are obstructed, the respiratory muscles are exhausted, and consolidation is present, the embarrassment of respiration is too great in open pneumothorax and asphyxiation gradually results. However after the acute empyema subsides, consolidation is gone, the respiratory muscles have recovered and the mediastinum is stiffened by adhesions this embarrassment does not result. They moreover point out that lung surgery is grave and chest openings must be closed immediately.

The X-ray has been used to show the extent of old draining empyemic cavities. Thorium nitrate and potassium iodide have been suggested for filling the cavity in order to get the picture, but the best mixture seems to be that of Stevens consisting of a sterile combination of cotton seed oil with 20 per cent. bismuth subnitrate and 3 per cent. powdered acacia.

Finally in the treatment of empyemas the patients must be exceedingly well fed so that the nitrogen waste which is quite excessive can be equalized. The prevention of cicatricial fixation of the lung after the empyema has healed should be prevented by blowing against resistance, by the use of negative pressure, and by physical exercise.

Other complications, such as pericarditis, otitis media, jaundice, mastoiditis, meningitis, interstitial emphysema and pneumothorax, peritonitis, and lung abscess are not especially common as shown by the post mortem examinations by McCallum and others. However, they should be kept in mind and watched for carefully.

Many prophylactic measures have been developed during the last year as a result of the prevalence of these pneumonias. In the Army camps resistance to infections has been definitely lowered by exposure to wet, by insufficient clothing and food, and by exhaustive work. Eradication of these conditions has been attempted. The use of masks by all who treat infectious diseases has become routine in the Army. It is quite evident however, as Maxey emphasizes, that the danger of droplet infection through the eyes is quite as great as through the nose and mouth. Thus for adequate protection large glasses should be worn as well as masks. In the Army, patients have not been allowed to smoke, since germs can be carried in that way. Careful regulation of wash rooms has been insisted upon. The demonstration that healthful people can carry pneumonia producing germs had become definite. Cole has shown the frequency of pathogenic pneumococci in the throats of healthy persons who have been in contact with pneumonic patients, and Ingraham recently has pointed out again the similar finding of streptococci as a result of contact with patients infected with those or-

ganisms. Finally the demonstration of the success of quarantine of all patients until accurate diagnoses are made and the distribution of such patients in wards where like infections are only present has been shown to discourage the spread of such diseases.

As a preventive for pneumonia definite evidence, such as that of Fennel in an excellent recent article. begins to show the success of pneumococcic lipo vaccines in the prevention of pneumonia of all types included in the vaccine. Rosenow moreover is of the same opinion. Camac prophesies good prophylactic results in the use of carefully prepared polyvalent streptococcal vaccines. The failure of former attempts in prophylaxis has probably been due to the non-inclusion of the proper strains of pneumococci and streptococci in the vaccine which has been administered.

In conclusion I wish to lay emphasis on the following facts.

1. Pneumonia of unusual severity and varying mortality has been most prevalent during the last year, especially in the Army camps.

2. The diagnosis of these pneumonias, especially of the lobar type, has been greatly facilitated by the use of the X-Ray.

3. The treatment of these pneumonias with large doses of digitalis and in suitable cases with serum has undoubtedly reduced the mortality.

4. Empyemas developing early in pneumonias due to the streptococcus have been found especially fatal unless repeatedly aspirated until the pus became thick and creamy, when surgical intervention, preferably by a closed method, might be resorted to safely.

5. Many new ideas for successful prophylaxis have been worked out including the use of pneumococcic and possibly streptococcic vaccines.

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(Note: This communication is a digest of some one hundred articles which have appeared in the medical literature of the past year. A few of the most important references are given.)

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CYSTITIS AS A DIAGNOSTIC FALLACY.*

By GEORGE G. REINLE, M. D., and E. SPENCE DE PUY, M. D., Oakland.

Nephritis, Cystitis. Of all the recognizable disease pictures of the urinary system these two as diagnoses rank highest in degree of popularity. So almost exclusively are these terms used that one might question whether other urological conditions are sufficiently well kept in mind, and whether in truth the terms cystitis and nephritis have a definite meaning in the minds of their users. More frequently than should be, are disturbances of the urinary system lacking in definite recognition. It is only within quite recent times, however, that urinary diseases have been studied in terms of living subject; heretofore they have been classified in accordance with the findings of the mortuary room, and effort made to fit the symptoms of the living to the findings of the dead.

Urine reports are closely scanned, but are all of the findings given due consideration? The diagnoses reached from the urinary reports are commonly far from ideal. As frequently interpreted, if there are casts, irrespective of reported white blood cells, the case automatically becomes one of nephritis, the type, depending upon the specific gravity and urine output or, if there is pus, and no casts, the case is not uncommonly concluded to be one of cystitis. In all probability neither of these diagnoses is correct, but in regard to the latter we wish particularly to call attention.

That the number of diagnoses of cystitis is too common and is not particularly creditable; a multitude of diagnostic sins hide behind it. Cystitis as a diagnosis is applied to pathological conditions ranging in location from the meatus urinarius to the cortex of the kidney. This is unfortunate when the grave consequences are considered, for while actually priceless time is being whiled away in the consumption of demulcents, the ingestion of urinary antiseptics, the injection of vaccines, and irrigations of the bladder, one and often both kidneys are frequently undergoing degeneration beyond repair.

Cystitis as a diagnosis will not do. We must realize that the term, as indicative of a disease, is of but limited significance. This is a conclusion fully concurred in by all urologists. A diagnosis of cystitis at the best can be but 4 per cent, which leaves small margin of comfort. Cystitis is no more a disease than is "dropsy" or "inflammation of the bowels."

Calk has this to say: "Cystitis as a disease is extremely rare, it is usually representative of some co-existing infection either in the upper urinary

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